INTERVIEW WITH PROFESSOR ANDREW HARVEY

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by

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Andrew Harvey is Professor of Econometrics at Cambridge University and Fellow of the Corpus Christi College. He is the author of three well known books, another three edition books and more than one hundred articles related with time series analysis of economic variables. His contributions are well known within the econometricians as he was the precursor of the popularization of the implementation of unobserved component models for the analysis of economic time series. At the moment, he is visiting the Statistics Department as holder of one of the Carlos III of Madrid University-Santander Bank Group Chairs of Excellence. He has a close relationship with the University Carlos III as he has visited us in the past for several courses and seminars.

Hi Andrew, first of all I want to thank you for your collaboration with the Bulletin of EU and US Inflation and Macroeconomic Analysis by answering a few questions related with your research on the dynamics of macroeconomic and financial variables.

Research

Let me start by asking you about your research. How do you described which are your main contributions both from the methodological and user-oriented points of views?

I suppose my main contribution has been to unobserved component modelling. It took a long time for econometricians to become aware of how powerful such models are, but I think that most time series econometricians would now see them as a fundamental tool. The STAMP package has helped practitioners to see how easy unobserved components models are to implement and how effective they can be when confronted with real data.

Your work is well known between the econometricians and practitioners because of your proposal of analysing economic and financial time series by using unobserved component models (UCM). Therefore, I have to ask you about them. In the univariate context, what is your view about their role when compared with the most popular ARIMA models to represent the dynamic properties of time series? When dealing with relationships between several variables, how do they compare with ADL models? Which do you think are the most important developments in the future in the context of UCM?

The attraction of UC models is that it is usually clear what is going on. The model provides information – for example on trends and cycles – that is straightforward to interpret. Furthermore with the graphical output in STAMP one does not have to be a time series expert to understand what is happening. By contrast, an ARIMA model is a pure forecasting device. It is simply weighting past observations in order to minimize the sum of squares of one-step ahead predictions.

I know that you are working on models in which the disturbances are defined in terms of the score instead of assuming as usual that they are Normally distributed. Which do you think is the potential of these models in terms of the way we do Econometrics?

The class of nonlinear models in which dynamics are driven by the score of the conditional distribution are, I believe, a very significant development. Siem-Jan Koopman and I have been working on different

aspects of these models over the last few years. The more we studied the properties of these models, the more we became convinced that they represented a significant development. However, one problem that we both faced was the lack of asymptotic results for the maximum likelihood estimator. My research was focussed on a modification of the EGARCH model and no asymptotic theory of any practical value had been developed for EGARCH. However, my stay in Madrid proved inspirational –I'm not sure if it was the Rioja or the Albariño – and I was able to prove the asymptotic results. What is really exciting about this theory is that it is both simple and comprehensive. For example, it covers the multiple indicator models (MEMs) that have been used for duration and range, as well as EGARCH models. Perhaps surprisingly, the use of the score to drive the dynamic equation means that heavy-tailed distributions pose no problem.

In order to incorporate more information about the future distribution of the variables of interest, there is an increasing interest between econometricians about obtaining density forecasts. How do you think that the recent developments in modelling volatilities can be incorporated in the forecast of densities of macroeconomic variables?

Forecasting the whole density is important in time series econometrics. For the score driven volatility models I have been developing, the multi-step predictive distribution can be simulated very easily. As a result measures such as value at risk and expected shortfall are easily estimated. A good deal of the volatility literature has focused on predicting variance, but variance is of limited value for non-Gaussian distributions. Models with a changing level and changing volatility can be estimated and these might prove useful for density forecasting of inflation.

Which do you think are the most interesting areas of research in dynamic econometrics for the future?

There is a good deal to do on score driven models. The main challenge is to extend the techniques to multivariate series. Siem-Jan Koopman and his co-workers have made some progress here with a very nice paper on multivariate GARCH with a conditional t-distribution.

It seems that many economists just look at theoretical models without looking at data while others often fit models to data without an economic justification. What do you think it should be the relationship between theory and real data?

It seems to be self-evident that economic models should be confronted with data and that econometric models should take account of basic economic ideas. However, many macroeconomists seem unwilling to take econometrics seriously. They are so wedded to their theories that they make every effort to ensure that the data supports them. For example, DSGE models are currently very fashionable. To me, the underlying economic theory is not very convincing and the dynamics – one lag and an expectation – are unrealistic. However, by using Bayesian techniques, macroeconomists are able to choose prior distributions that lead to the key parameters being within the range that their theory suggests. Of course, this proves absolutely nothing. The difficulty is that once this kind of nonsense becomes embedded in the literature it is difficult to shift.

Time Series Econometric models for decision making

By looking at the deepness of the crisis that we are going through, it seems to many people that econometricians have fail to predict it. Do you think that this is the case? How do you think Econometric models can help to anticipate better such a large decline in economic and financial variables?

I think it would have been difficult for econometricians to predict the exact nature of the crisis since part of the cause was the way in which the financial institutions were obscuring the nature of debt. However, it is clear that economists should have done better and seen some of the warning signals, such as house prices going way above a level compatible with incomes.

Nowadays many researches and most users of predictions still focus on point predictions. One just has to look at newspapers to realize that often they only report point predictions of the variables of interest. Then, if these predictions are not close to the realized values, most people think that the models used to obtain them are useless. Do you think it can help to predict better if we move from reporting just point predictions of future values to incorporate some kind of measure of the uncertainty associate with these variables? How do you think the idea of prediction uncertainty can be incorporated in such a way that practitioners incorporate it in their decision making mechanism?

It would certainly be desirable to provide some measure of uncertainty. The difficulty is selling the idea to the general public. The weather forecast is sometimes give in terms of probabilities, for example, there will be a 20% chance of rain, but it seems that not everyone is able to appreciate such statements and most countries don't give forecasts in this way. Perhaps forecast distributions should be given as an option to users who can cope with them. They are clearly of value in decision making.

University organization

Looking now at the university, which kind of policies do you think can help to put Carlos III among the best European universities?

I think that Carlos III has a good reputation in economics and econometrics. Working and publishing in English is crucial as it means competition with the rest of the world and hence meeting the same standards. There may be problems with departments where the subject matter is less international.

I want to ask you about the relationship between the formation of undergraduate students at the university and the necessities from the academic and professional points of view. Which do you think is the adequate balance between professional training and abstract thinking for undergraduate studies?

To my mind, the main purpose of an undergraduate program is education. In other works teaching students how to understand difficult concepts, how to synthesize ideas and how to think critically. If students have been properly educated they will be in a good position to develop the skills needed for their chosen career. Post-graduate training offers the opportunity to learn more about the techniques used in the subject. However, this should not be at the expense of developing original thinking. One of

my worries about current PhD training is that students are expected to study such a large amount of material that they have no time to think about wider issues or to challenge current orthodoxies.

Do you think that quantitative techniques should be an important component in the formation of Finance and Economic students?

Yes. You cannot work in finance or economics without having some knowledge of quantitative techniques (and their limitations).

I want also to ask you about a dilemma that young academics have now. In most promotion careers you need a given quantity of papers but when, you look at journals, you can see many papers with very marginal contributions. Which is your view about how we should orientate the way people do their careers?

I think there is a problem in that there is an incentive to write papers that just add a small amount to what is already known. Even worse is that fact that certain areas become fashionable and it is then easier to publish in that area than to do something different, something that might eventually make a bigger contribution to the subject. Macroeconomics is particularly problematic in that it is an area where an appreciation of how the world works in practice is of paramount importance. Yet the academic incentives are to do a clever piece of theory that is totally divorced from reality.

Thanks very much Andrew.